DOCUMENT RESUME

ED 289 042 CE 049 213

AUTHOR Eckles, Stephen G.; Miller, W. Wade
TITLE Perceptions of 1987 Master Gardener Participants toward the Use of Satellite Telecommunications for Educational/Extension Delivery.
PUB DATE 87
NOTE 55p.
PUB TYPE Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Adult Education; *Agricultural Education; *Communications Satellites; Delivery Systems; *Distance Education; Educational Research; *Extension Education; *Horticulture; *Participant Satisfaction; Student Attitudes

ABSTRACT

The 1987 Master Gardener program was presented at 16 locations in Iowa, where weekday sessions were supplemented with Saturday satellite telecasts. This cooperative extension service program provided special training in horticulture to members of the local community who would then work as volunteers through their local cooperative extension office to provide horticulture-related information to their community. Telecasts consisted of pretaped segments that alternated with phone-in question-and-answer sessions. A questionnaire collected data from 174 participants regarding the perceived effectiveness of this teaching method. The delivery method was economically feasible. The majority of the respondents were satisfied with the satellite portions of the program and were favorably disposed toward use of satellite telecommunications for other extension uses and for education in general. Nearly 98 percent indicated that the telecasts were either well done or very well done. Almost 90 percent said they would be willing to attend future extension programs using satellite delivery. Complaints were in two areas: technical problems and the speed at which the broadcasts presented the material. (The instrument is appended.) (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED289042

PERCEPTIONS OF 1987 MASTER GARDENER PARTICIPANTS TOWARD THE USE OF SATELLITE TELECOMMUNICATIONS FOR EDUCATIONAL/EXTENSION DELIVERY

by

Stephen G. Eckles
Graduate Research Assistant

and

W. Wade Miller
Associate Professor

Department of Agricultural Education
Iowa State University
Ames, Iowa 50011

1987

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

W W Miller

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CE049213

BEST COPY AVAILABLE

TABLE OF CONTENTS

	Page
CHAPTER I. INTRODUCTION	1
Impact of Information Via Satellite	1
Current Uses of Satellite Technology	2
Information Dissemination in Extension	4
Relation of Satellite Telecommunication to this Study	5
CHAPTER II. REVIEW OF LITERATURE	7
Written Sources of Information	7
Satellite Telecommunication Applications by Agriculture and Rural Users	7
Satellite Telecommunication Legislation	8
University and Extension Uses of Satellite Communication	9
CHAPTER III. METHODS AND TECHNIQUES	16
Description of Evaluated Program	16
Objectives of the Program and Study	17
Instrumentation	18
CHAPTER IV. FINDINGS	21
Personal Demographics	21
Horticulture Background	23
Horticulture Information Resources	24
Views on Satellite Education & Extension Delivery	26
Comparisons with Selected Variables	30
CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS	38
Conclusions	38
Recommendations	41

BIBLIOGRAPHY 45

APPENDIX A. QUESTIONNAIRE 47

CHAPTER 1. INTRODUCTION

Impact of Information Via Satellite

"Space, the final frontier" was the catchy opening line for the very popular TV series, "Star Trek". Though the use of satellite communications for the delivery of formal and informal educational programs is not the last development in education, "space" albeit satellite communications, is probably the most recent and possibly the most influential current development in educational delivery. The ISU pamphlet, Satellite Transmission Services, in quoting from John Naisbitt's Megatrends states, "'The space shuttle has a lot more to do with the globalizated information economy than it will ever have to do-in our lifetimes-with space exploration..... Satellites [have] transformed the earth into a global village.'"(Iowa State University) Telecommunications satellites are capable of delivering both educational programs and informational materials on a state, national or international level, and can do so with great expediency and high quality.

An article written by Brown in the T.H.E. Journal mentions that the storage and transmission of knowledge has proceeded chronologically from the human brain, to print in the form of books, to computers, and now onto telecommunications. (Brown) In this article Brown states that "The birth of telecommunications for campuses is an indication that the usefulness of this form of knowledge communication is now appreciated. Besides being very palatable to the current generation of students and increasingly affordable, it is a system which can integrate gracefully with the traditional library and the high-powered computer." (ibid.)

This is definitely the "information age." This is evidenced by the fact that over 90 percent of all scientists who have ever lived are alive today. It should come as no surprise therefore, that the knowledge base in all science disciplines is increasing at a phenomenal rate. (Moore) Satellite communications are playing an

increasingly important role in the efficient, effective, and rapid delivery of this knowledge, and in narrowing the information gaps which exist. Those who are poorer economically and educationally, and more isolated physically, can and are being benefitted. In order to achieve the objectives of dissemination and reduced information gaps, Extension must both make use of those technologies which are more widely accessible, and strive to increase people's access to these technologies.

As stated previously, satellite communications aid in the timely transfer of new information, which has been a problem in the past. Extension staff, many of which have had to take on additional responsibilities due to budget cuts and the resulting lack of personnel, find it increasingly difficult to keep abreast using traditional Extension inservicing. This inservicing typically means travelling to the campus, a time and money expense which is ill-afforded. Today's situation makes this impractical and impossible for some. The time lag between new information and its dissemination must be considered and addressed. (Bjorklund)

Current Uses of Satellite Technology

Telecommunications allows for formal educational institutions, along with Extension and other informal education and information delivery groups, to reach those who would not or could not be reached via traditional delivery systems. (Dean) Satellites can be used for both radio and television broadcasting of educational programs or information. Five land-grant universities are currently using satellite communications to telecast Extension and informal and formal educational programs. These universities are Oklahoma State, Kansas State, Ohio State, Nebraska, and Iowa State. Of these, Iowa State essentially has its own satellite transmission system through its tie with the university-affiliated television and radio station, WOI.

Equipment such as videocassette recorders, which are now found in 36 percent of American homes, and permit learners to record what they want when they want it, and play it back at their own discretion, are changing the face of today's education. (ibid.)

Programs can be viewed when the "student" so desires. Thus educational scheduling is becoming less of a problem.

Statistics show that 30 million U.S. homes will never be within a cable-wired area. (REC-Vol.41 No.1) These people need means whereby they can gain access to news broadcasts, educational programming, financial and commodity reports, weather reports and entertainment. Many have achieved this by acquiring satellite dishes. Currently there are 1.5 million satellite dishes in use around the country, and a million or more of these are owned by members of rural electrical cooperatives. (ibid.)

The affordable use of satellite telecommunications has become a concern of certain segments of the rural community. Through a joint effort between the Cooperative Finance Corporation and the National Rural Electric Cooperative, a new organization was formed--the National Rural Telecommunications Cooperative (NRTC). This organization negotiated with several satellite TV programmers to develop and make available to rural owners of satellite dishes a program package that would be offered at a very reasonable monthly cost. (REC- Vol.41 No.1) The NRTC signed agreements in principle with 12 program channels to allow NRTC to make such low-cost programs available. (Farm Bureau Spokesman) Some regional REC's (Rural Electric Cooperatives) have joined the NRTC, and others are surveying their members to determine whether or not to provide this service. NRTC is also planning to develop and deliver other telecommunications services. These include bi-directional (two way) transfers of data, voice and video to rural members and REC personnel via satellite. (REC-Vol.41 No.1)

Cost, as mentioned earlier, is a factor to consider. Newer, highly-powered systems no longer require high-cost, high maintenance receiving dishes. To give an example, such systems as Ku-Band, Direct Broadcast Satellites can transmit directly to individual homes. (Rosenweig) Satellite transponders, which are equipment on the satellite which amplifies and converts the received signal to a different frequency for transmission to receiving dishes on earth, have had some of their rental rates drop from over $2,000 per hour a few years ago, to under $250 per hour today. Uplink costs remain high, about $200 per hour. Receiving

dish prices have dropped to under $1600. (Vocational Education Journal) Therefore, using satellite communications for delivery is becoming increasingly affordable by government, business and individuals.

Information Dissemination in Extension

Information is a key resource in rural development, and the communication of information is a major function of Extension. It is therefore no surprise that Extension practitioners are taking a look at the potential contribution to their work of mass media and communications technology. Increased speed, efficiency, capacity, quality, etc., are continuing to develop, as Garforth states in Media in Education and Development, "at a time when extension organizations are looking for more cost-effective ways of making useful relevant information available to rural people. At the same time, there is growing recognition of the need to support extension workers in the field, both by contributing to the general information environment within which they work, and more directly, by providing them with extension aids and updating their own technical expertise and knowledge." (Garforth)

Garforth continues by stating that mass media and Extension aids have been used for many years. Yet, there are three technological trends which are significantly increasing their potential role. The decreasing cost, the increasing reliability, and the relative use of much of the recent communications technology jointly comprise the first trend, which is easier adoption being facilitated. (ibid.)

Communications satellites are part of the second trend, which is technical developments in the transmission of data. Integration of the communication technology components is the third trend. Here data processing and storage are combined with the ability to transmit the data very rapidly. (ibid.)

Education and Extension must recognize an additional aspect of telecommunications which is apt to be overlooked--control. This is so because "the ability to store and communicate information

confers power: power to determine what information is made available to whom, power to influence the perceptions and attitudes of large numbers of people." (ibid.)

As with any technology, telecommunications must be examined to determine how it will support Extension. Budget and staff must also be taken into account. These steps need to be considered before an investment is made in new communications technology.

Relation of Satellite Telecommunication to this Study

This creative component sought to address some of these issues. It will examine how Iowa State University and its Cooperative Extension Service have utilized monies, staff and time in delivering educational programming, and what its short-term plans are along this line. Specifically, it sought to determine what are the perceptions of a particular Extension target audience toward the use of satellite communications in delivering part of an Extension education program. The target audience in this study was made up of those 1987 Master Gardener participants who viewed the Master Gardener satellite broadcasts.

The Extension Service required that there be an evaluation done of the satellite programs. This requirement was made so that Extension could evaluate how to make the best use of its financial resources, staff, and equipment resources in relation to satellite programming. An even greater goal was to determine the worthiness of Extension satellite programming.

With the advent of efforts by the federal government to cut Extension budgets, Extension services nation-wide have responded by cutting staff. Extension was also forced to examine alternative ways to meet the needs of its constituency. Satellite communications is seen by some state Extension administrators as a way to supplement the personal contact between Extension staff and clients, which had been a trademark of Extension but now was seen as an approach which was no longer affordable. Personal contact, while still seen as a necessary approach by Extension, is yet becoming less practical as Extension's client base increases.

For these reasons, satellite delivery of Extension programs

must be examined, and its pros and cons listed, in order to determine its usefulness in meeting the needs of Extension's audiences. Some states are already committed to extension's use of this method of delivery, and others are exploring how they might make good use of it. Thus, the need for a study such as this exists.

CHAPTER II: REVIEW OF LITERATURE

Written Sources of Information

Since satellite communications for educational/Extension use is a relatively recent phenomenon, most of what has been written is found in periodicals and the popular press. It is interesting to note that even though the 1986 Yearbook of Agriculture, entitled *Research For Tommorrow*, has chapters focusing on "The Future of Electronic Technology in Research and Extension" and "The Agricultural Agent of the Future", there is no mention of the use of satellite communications, even though an increasing number of state Extension offices are making use of this technology. (Crowley) Yet, almost weekly there are articles concerning how satellite communications are being used, both in Extension and education.

Satellite Telecommunication Applications by Agriculture and Rural Users

The agricultural sector is beginning to make use of this technology. A company called Agri-Sat plans to be the first network devoted directly to agriculture. Satellite dishes, which are being seen increasingly on U.S. farms, are the key to this venture, according to a company spokesman. He says, "'There's a need for instant information and agricultural programming that's not being met at the present time. Satellite TV is the best way to do it.'" Agri-Sat will do such things as run educational programs on product news, comparisons, repair guides, chemical application and calibration, and other informative presentations. Eventually teletext will be added, with up-to-date information on weather, agricultural news, and markets being run continuously and accessed with a decoder. The company is confident that farmers will watch since 99% of those surveyed thought it was a good idea. (Johnson)

A rural electric cooperative in Iowa recently (January 1987) became the state's first to form a satellite cooperative. This was

done to allow rural residents to receive scrambled satellite transmissions at a reasonable cost. The cooperative plans to provide descramblers and may provide satellite dish installation. This cooperative is part of the National Rural Telecommunications Cooperative, which has signed an agreement in principle with 12 TV channels to allow NRTC to package the programs at one low price, instead of subscibers having to pay higher prices for each channel. At the end of 1986, membership in the NRTC totaled 253 cooperatives. Glenn Lovig, executive vice president of the Iowa Association of Electrical Cooperatives, feels that providing the satellite packages is important "'in order to ensure the standard of living in rural areas is maintained.'" (Steimel)

The Rural Electric Cooperative to which the author belongs conducted a survey of its members regarding whether it should get involved in providing unscrambled programs to the membership. The number of surveys returned was small, but the vast majority of the responses (163 out of 169) was that the cooperative should be involved in providing this service. (Greene County REC)

Satellite Telecommunication Legislation

There has even been legislation introduced to assure rural satellite dish owners access to "scrambled" television programs at a reasonable price. This occurred on March 31, 1987 when Rep. Billy Tauzin (D.-La.) introduced the bill in the House, and Sen. Albert Gore (D.-Tenn.) introduced it into the Senate. The bill, entitled the Satellite Television Fair Market Act, would require satellite television programmers who sell their signals through cable companies to also sell these signals through other organizations. The Federal Communications Commission (FCC) would also be required to make available a way for rural areas to pick up network television which signals they are not currently able to pick up. Rep. Tauzin said that rural people should not have to pay for services that city dwellers are provided free of charge. The bill would also require the FCC to establish standards for decoders, which are needed to "descramble" encrypted programs. The purpose of this section of the bill is to make sure consumers are

not required to to buy a different decoder for each program. The bill does not dictate prices for this service. Sen. Gore wants the marketplace to set the price, but feels this is not the case now because the cable companies have no competition in the distribution of satellite programming. (REC News Vol.41 No.5)

University and Extension Uses of Satellite Communication

What is being done with satellite communications at the university level and with the Extension Service? According to a letter received from Ovid Bay, Director of Information and Communications with the USDA in Washington, D.C., the states doing the most programming on satellite are Kansas, Oklahoma, Iowa, Ohio, and Nebraska. Bay commented that Virginia had just installed downlinks in 24 locations in the state. The Virginia Cooperative Extension Service (VCES) has outlined an eight-month pilot project as a first step for Extension to systematically implement the use of satellite broadcasts. Downlink dishes were to be installed at 21 Extension offices and 4 research stations in the state by the end of March of 1987. This would be 25 sites rather than the 24 stated by Bay. This pilot project is to include five major programs:

1. Out-of-State Broadcasts: The VCES staff will incorporate the out-of-state broadcasts in their programming as they think appropriate.

2. Marketing Update: One-hour programs by Extension Specialists will be broadcast live bi-monthly, with participants being able to interact by telephone.

3. Special Event: One special event is planned for the pilot program period and will conducted by VCES program leaders.

4. Timely Issue Series: Twice monthly, during the pilot period, one-hour programs will be broadcast on timely issues.

5. Volunteer Training: During the pilot project, the majority of the programs will be intended for Extension staff. One exception will be a training program for volunteers. (Bay)

A response from Larry Whiting, Head of Information and Applied Communications with the Ohio Cooperative Extension Service, revealed that about half of the programs for the balance of 1987 (April on) are in-service --information primarily for Extension faculty statewide. The balance of the programs were planned for public consumption and would be publicized as such both in Ohio and elsewhere. Examples of some of the programs include Grain Marketing, Africanized Bees and Bee Mites, The 4-H Advisor, Swimwear to Meet Special Needs, etc. There was even a list of Additional Requests for future satellite programs which included subject matter in Agronomy, Animal Science, Community and Resource, Dairy Science, Food Science, 4-H, Horticulture, Natural Resources, Plant Pathology, and Veterinary Medicine. These programs must have been tentatively planned to be broadcast because there was either a presenter and/or producer name next to the topic. Mr. Whiting reported that the university did not yet offer any courses for credit over satellite. (Whiting)

Another university offering satellite programming is Oklahoma State. Its first broadcast was on the Master Gardener program and was done in October of 1984. Other topics have dealt with nutrition, international trade policy, the farm crisis in Oklahoma, tax laws, alfalfa management, etc. Future program titles (March 1987 on) included Recreation for the Disabled, Clergy and the Aging, Home Based Business, Home Canning, etc. (Allen)

According to Jack Burke, Head of the Department of Extension Communications for Kansas State University, Kansas Extension had done four satellite videoconferences. They were:

1. <u>Classification and Reappraisal</u> which concerned mandated reappraisal and a ballot measure for classification of

property to prevent massive shifts in tax liability of certain groups.

2. Farmers and the Law- an analysis of legal issues facing farms-bankruptcy, new legislative programs in Kansas, fence laws, etc.

3. Heartache in the Heartland- Helping Children through the Rural Crisis.

4. Alternative Crops for Kansas.

The next videoconference was to be Revitalizing Rural Kansas, an economic development effort. As is the case with the other programs, this videoconference is non-credit.

Burke provided an evaluation of the first effort, and stated the others had similar results. The first conference was held at 34 sites, and 440 out of 604 attendees returned an evaluation form. This was a 73% return. Some things learned were:

1. 18% had attended a video telephone conference before,

2. 86% thought the conference was equally or more effective than a conventional face-to face meeting,

3. 86% said the conference exceeded their expectations (35% said it exceeded to a great or very great extent).

More than 90% of the audience was familiar with Extension, though many agents reported the audience was different from their usual group. More than a fourth of the attendees reported never or seldom contacting Extension in the past year.

Most agents commented that the satellite is a good way to reach many and different audiences. Several agents also requested that they be knowledgeable about the subject matter before a telecast and that clear instructions be given about handouts, etc.

from Ohio. (ISU Cooperative Extension Service)

DeWitt stated that there should be 35 dishes installed in the state by late spring of 1987. These dishes would be at such sites as area Extension offices, county Extension offices, and the university experiment stations. At the time of the interview 6 of the 7 area Extension offices had the dishes. (DeWitt)

To date, Iowa State University has offered two courses for credit via satellite and through the College of Agriculture, with each being one credit. The first was "Current Economic Issues in Agriculture". It was offered as either Ag Studies 490 or as a 590 course in the agricultural department of choice. Thus it was offered either as an undergraduate or graduate course. The broadcasts aired on Saturday mornings for two hours during the months of February and March in 1986. The second was "Understanding and Application of Biotechnology in Agriculture". This could be taken as either an Animal Science or Agronomy graduate level class. It was offered on Saturday mornings in November and December of 1986.

A survey conducted on the first course revealed the following information. Twenty-six participants enrolled in the course as Ag Studies 490, and eighty-six took it as a 590 course in the agricultural department of choice. This was 23.3% and 76.7%, respectively. The location from which the telecasts were viewed were: 17% WOI-TV studio, 40% at a central site arranged by the university, 20% in private homes, and 23% at other sites. For distance traveled to get to a viewing site, 56% traveled 0-5 miles, 6% traveled 6-10 miles, 13% traveled 11-25 miles, and 25% traveled 26-50 miles. In response to how well they liked this type of class presentation they responded as 46% -Very Good, 50% -Good, and 4% -Fair. As to what extent the participants think they learned the results were Much-35%, Some-56%, Little-9%. When asked whether they would be willing to pay an additional fee to have courses offered via television to save having to drive to a central site, 31% said -Yes, Definitely; 60% said-Yes, with hesitation; and 8% said-No. Saving time and travel was what 34% liked most about the course being offered via television, and fitting their schedule was

(Burke)

Iowa State through its affiliation with WOI-TV is also heavily involved in the use of satellite communications. This is because WOI-TV recently installed a new video transmission facility at its Ames, Iowa site. As an ISU pamphlet states, "this sophisticated tool can carry teleconferences, advanced education, and training to the farthest reaches of the state, the continent, and throughout much of the hemisphere." (Iowa State University) According to this same source, the uplink uses include Extension demonstrations, special seminars for business and industry, and internal conferences. It also discusses the cost benefits of reducing travel time and expenses for staff and students, employers and employees, and avoiding loss of productive time. Teleconferencing via satellite can increase productivity by allowing individuals to take part in more meetings in a given time and providing some individuals who would not ordinarily be able to receive additional training to do so.

Jerry DeWitt, Assistant Dean/Associate Director for the Iowa Cooperative Extension Service, stated during an interview with the author that Extension programs which the state of Iowa has offered via satellite include sulfa avoidance, emergency grain storage, a four-part series dealing with part-time farmers, and debtor-creditor relations. Others that either have been done in the past or are planned for the future include a state-wide broadcast of the state 4-H conference, swine health, chemical right-to-know, and sessions of the Master Gardener program. The university was also cooperating with Iowa bankers in planning a program for both farmers and bankers dealing with the new Chapter 12 bankruptcy laws. (DeWitt) Another new program that will involve Extension use of satellite for program delivery is a TV program series called "Great American Woodlots," a creation of the University of Maine Cooperative Extension Service. Iowa Public Television will tape the program off satellite, and run the series during the summer. Extension offices have the option of taping the series off satellite or broadcast. The program covered such things as windbreaks in Nebraska, maple syrup production in Minnesota, Christmas tree farms in Texas, and abandoned strip mine forests

what 21% said they liked best. All of the respondents said they would be willing to enroll for additional courses offered via TV. (ISU College of Agriculture)

Purdue University presented the first of three workshops geared at helping faculty and staff learn more about video education opportunities. A total of 375 attended the 3 1/2 hour training entitled "Use of Video in Education". These workshops are a joint effort of agriculture, pharmacy, engineering, and continuing education. The other worshops will be "Use of Video in Research" and "Use of Video in Outreach/Extension". A seminar in October 1986 set the stage for these workshops. (Bay)

The 2nd Annual Instructional Technology Conference was held at the Virginia Tech campus in Blakesburg on April 27-30, 1987. The purpose of the conference was to promote an exchange of ideas among states relating to the development and use of various electronic technologies in delivering Extension information and educational programs. The conference focused on planning for and selecting new and emerging technologies. A one-day pre-conference was held which offered introductory level sessions on various topics. (ibid)

What has been done by the federal government with satellite programming on the national level? A historical training conference via satellite using the latest techniques and technology for training took place on December 9, 1986 when more than 5,000 USDA managers and supervisors took part in a program on equal employment opportunity and civil rights. The 77 official downlink sites for the conference are a record for any USDA video conference. (ibid)

The USDA offers a monthly mailing about the satellite programs available across the country that deal with USDA/Extension programs. The USDA itself offers regularly scheduled programming that includes USDA News, Down To Earth (a news feature), and A Better Way (a consumer program), on a twice a week basis. (ibid)

Extension can use communications technology to narrow the information gap. Those who are poorer economically and educationally, and more isolated physically can be benefitted. In order to acheive this, Extension must both make use of those

technologies which are more widely accessible, and strive to increase people's access to these technologies.

CHAPTER III: METHODS AND TECHNIQUES

Description of Evaluated Program

Before proceeding with the details of the evaluation of this program, it is best to describe the total program. The Master Gardener program is a Cooperative Extension Service program which provides special training in horticulture to members of the local community who take an active interest in their lawns, trees, shrubs, flowers, and gardens. In exchange for their training, persons who become Master Gardeners agree to spend at least 40 hours as volunteers working through their local Cooperative Extension Office to provide horticulture-related information to their community and/or other services. This volunteer service may involve answering telephone requests for information related to gardening, conducting workshops, helping establish and/or maintain community garden plots, etc. The program is publicized through such avenues as Extension newsletters, local newspapers, and public service announcements on cable television or radio. Those interested in the program can then enroll via the nearest Extension office which offers the training. Enrollment is limited by the number of participants the local Extension staff feels it can accomodate.

Classes are taught by I.S.U. Extension staff, and in some cases, those individuals who were certified in past years as Master Gardeners. Extension staff typically includes the local County Extension Director or Agriculturist, and area and/or state specialists. The program offers 40 hours of instruction covering topics in lawn care; ornamental trees and shrubs; insect, disease and weed control; soil and plant nutrition; vegetable gardening; houseplants; and garden flowers. The training is given from January through March, and has been offered in Iowa every year since 1979. A typical format is two 2-3 hour sessions per week for eight weeks to make up the 40 hour total. Upon the completion of the 1987 program, 46 counties will have been involved since 1979 in providing this type of training.

Participants become Certified Master Gardeners after they have completed the training and passed two exams (a mid-term and a final) based on the material presented. Upon satisfactory completion of the requirements, participants receive a graduation certificate to recognize them as Certified Iowa Master Gardeners. Depending upon the local Master Gardener coordinator, recertification may be required. Typically, this involves attending one of the sessions taught in succeeding years or attending a community workshop led by the new Master Gardeners.

The 1987 program was presented at 16 locations, five of which were offering Master Gardener training for the first time. Residents from more than 36 counties were involved. Whereas 300 people were trained in 1986, there were approximately 350 participants enrolled in the 1987 Master Gardener program.

Participants attended the weekday sessions at the nearest County Extension Office which offered this training program. The four satellite telecasts, were conducted one each Saturday morning for four Saturdays. The telecasts were as follows: Session #1 - Plant Pathology, Session #2 - Turfgrass Management, Session #3 - Vegetable Gardening, Session #4 - Landscape Plantings (i.e. trees and shrubs). Each telecast was conducted by a different state Extension horticulture specialist.

The telecasts ran from approximately 9:00-11:00 A.M, and each telecast had the same general format. Telecasts began with a 15-20 minute pre-taped segment covering a particular sub-heading of the subject. After the taped segment, 5-10 minutes were alloted for participants to call in questions they had which dealt with the sub-heading. There were about four pre-taped segments for each program, and each pre-taped segment was followed by the question and answer period. This question and answer segment was conducted "live" and involved the specialist and a moderator. Prior to the beginning of each telecast all participants were given cards on which they would write their names and any questions they had about the pre-taped material. They would then give these cards to the CED or his/her representative, who would in turn call the questions in to WOI on a toll-free line. Phones were set up at WOI to take

the calls. People were assigned to staff the phones and they would write down the following information on cards:the name of the person asking the question, the county they were from, and the question itself. Runners would then take these questions into the studio where the moderator would read the information on the card, and the state specialist would answer the question. Any questions not answered during the telecast would be answered by letter.

The sessions were viewed by the participants at one of 16 downlink sites around the state. Downlink sites are locations set up with satellite dishes which receive satellite transmissions. These sites included area community colleges, area or County Extension Offices, and in one case someone's home. The only Master Gardener participants who did not view these sessions in the same manner as the rest were those who lived in or close to Story County. They viewed the pretaped portions of these sessions on television, as did those viewers at other sites. However, they did so while sitting in the WOI-TV studio from which the live telecast originated. During the portion of the program where state specialists were asked called-in questions, the Story County group was able to view this in-person in the studio. The population surveyed in this study was all the non-Story County participants who viewed the telecasts.

Objectives of the Program and Study

The major objective of the 1987 Master Gardener program telecasts was to provide quality educational information to the Master Gardener participants, and at the same time reduce the amount of travel time and resources expended by the state Extension specialists. The second objective was to use this as a pilot program to test the perceived effectiveness of such a teaching method, as viewed by the audience. A third objective was to develop tapes from the sessions, and in turn allow their use by such channels as Iowa Public Television, or to provide them to Extension offices for horticultural education of Extension's clientele. Each state specialist had his/her own session

objectives. The purpose of the author's study was to determine the perceptions of the 1987 Master Gardener participants toward the use of satellite telecommunications for educational/Extension delivery.

An unstated effect which resulted from this project was an increase in the contacts the state specialists have with Master Gardeners, albeit vicariously with this project. In addition, feedback from this project may give insight into the use of satellite uplinking for educational delivery outside of the realm of Extension. An example of the latter might be teacher in-service.

Instrumentation

The population was surveyed by use of questionnaires. The questionnaires were designed with the assistance of W. Wade Miller and Robert A. Martin of the Department of Agricultural Education at Iowa State University, and Linda Naeve of the ISU Horticulture Department. There was a separate questionnaire for each of the four telecasts which asked questions directly relating to that telecast. The four weekly surveys were short in length, (ten questions or less). The final questionnaire asked questions relating to the telecasts as a whole. It also sought demographic data so that correlations could be drawn between independent and dependent variables. Questions and statements were included which sought the participants' perceptions on the future use of satellite telecommunications for Extension and educational programming.

Questionnaires were collected by the County Extension Director or his/her appointed representative. The questionnaires were then sent to Linda Naeve, a state horticulture Extension specialist and the project leader for this program. These questionnaires were in turn given to the author to tabulate and analyze.

Each questionnaire had a blank space which was to be filled in with the last four digits of the participant's social security number. This was done not only to ensure confidentiality, but also to determine how many telecasts were viewed by each of the participants. The study sought to know the number of telecasts seen by each participant so that any influence the number of telecasts viewed had on the responses given could be correlated.

Questions were asked concerning age, educational background, employment status, etc. to determine the demographic background of the participants, and discover who was attracted to the program. Other questions dealt with what the participants liked or disliked about the telecasts so that changes could be made to make similar projects more effective.

After having been coded by the author, resultant responses from the questionnaires was key punched onto the Computation Center computer at Iowa State University by personnel of the Microcomputer Products Center. Analysis of data was done using the university Computation Center computer. The software package SPSS(X) was used to check for coding errors, to run frequencies, and to provide other statistical measures. Assistance from the university RISE (Research Institute for Studies in Education) office was furnished for programming needs.

CHAPTER IV: FINDINGS

Personal Demographics

The 1987 Master Gardener survey response population was comprised of 174 individuals. Therefore, the author wishes to caution readers that all findings, recommendations, etc. are based upon this group and not the entire 1987 Master Gardener audience of approximately 350 individuals.

There was nearly a 50:50 split between males and females, with percentages of 50.0 and 48.9, respectively. There were two non-respondents (NR) to this question for a percentage of 1.1%.

When examining repondents' ages it was found that this program attracted an older audience. Those 51 and over comprised 41.4% of the population, making this the age group with the highest percentage. Table 1 shows the age groupings.

Table 1. Age groupings

Factors	N	Percent
Under 20	0	0.0
20-30	21	12.1
31-40	46	26.4
41-50	35	20.1
≥51	72	41.4
NR (non-respondents)	0	0.0
Total	174	100.0

The participants were surveyed to determine agricultural background. Those with a farm background comprised 61.5% of the population. Those without a farm background were 38.5%; there was no missing data.

The population appeared to be well educated as shown in Table 2, with 43.7% having at least a high school education.

Table 2. Highest educational level achieved

Factors	N	Percent
In high school	0	0.0
Did not finish high school	4	2.3
High school graduate	76	43.7
Associate/two-year degree	10	5.7
Started, but didn't finish BS	30	17.2
Have BS degree	23	13.2
Education beyond BS	29	16.7
NR (non-respondents)	2	1.1
Total	174	100.0

Only 3.4% of the respondents were not able to have a garden where they lived, and the highest percentage category was those who lived on less than an acre (49.4%). Acreage dwellers (1-5 acres) made up 21.8% of the population, farm dwellers comprised 24.7%, and the NR (non-respondent) rate was 0.6%.

Table 3 records the employment status of the respondents. These figures add up to over 100% due to the fact that a person can be retired or in school and yet work part-time, or in school and employed full-time or part-time.

Table 3. Employment status

Factors	N	Percent
Part-time employment	45	25.9
Full time employment	80	46.0
In school	6	3.4
Retired	42	24.1
Unemployed	17	9.8
Total	190*	109.2*

* The participants were allowed to checked more than one category

Some Master Gardeners intended to sell horticultural products which they grow. During 1987, 22.4% expected to sell garden produce and/or flowers from their own enterprise. Two people (1.1%) did not respond.

Those gainfully employed in the horticulture industry made up 20.7% of the population. Of those gainfully employed in this field, 17 individuals (9.8%) owned and operated any or a combination of the following: a truck farm/greenhouse/floral shop/etc.; and 16 persons (9.2%) were employed by one or more of these horticulture businesses.

Horticulture Background

When asked about how long they had been active in gardening, 67.8% indicated "11 years or more". Only two individuals (0.6%) responded that the 1987 season would be their first year. There was nearly an equal percentage of those who had been active 1-5 years (14.9%) as those who had been active 6-10 years (15.5%). One individual (0.6%) did not respond.

A question was posed dealing with what items the Master Gardener audience were primarily responsible for. The results of

this question are found in Table 4. As can be seen, many participants were primarily responsible for more than just one item.

Table 4. Items of primary responsibility.

Factors	N	Percent
Houseplants	138	79.3%
Vegetable garden	148	85.1%
Flower bed/garden	142	81.6%
Small fruits	114	65.5%
Fruit trees	99	56.9%
Lawn	155	89.1%
Shrubbery/hedges	138	79.3%

When asked how much time was spent working in their lawn/garden/flower bed/etc. per week during the growing season, 3.4% indicated "less than 2 hours", 23.6% chose "2-4 hours", and 72.4% chose "over 4 hours". One person lived where he/she was unable to be involved in these activities.

Horticulture Information Resources

A series of questions were asked to get an indication of where the 1987 Master Gardener program participants sought horticultural information. The participants were asked if they had made use of Extension materials and staff for horticulture assistance prior to the 1987 Master Gardener program. Those who said they had were 67.8%, those who said they had not were 31.6%, and NR were 0.6%.

Master Gardener participants were asked to chose from a list provided all those magazines they read on a regular basis for horticulture information. The results are summarized on Table 5.

Table 5. Magazines read for horticulture information

Factors	N	Percent
Organic Gardening	84	48.3
Mother Earth News	46	26.4
Better Homes & Gardens	59	33.9
Horticulture	34	19.5
Iowa Horticulturist	16	9.2

Of the choices offered, Organic Gardening was on top with 48.3%. When asked to list other magazines read, the two which appeared most frequently were Flower and Garden and National Gardening.

Another question dealt with the first resource used when seeking new information on horticulture. When given choices of "my local County Extension Office," "garden magazines," and "others," garden magazines edged out the Extension office by 39.7% to 33.9%. "Others" were 15.5%, and NR were 10.9%.

Information was sought regarding how the respondents learned about the Master Gardener program. A number of choices were offered, of which more than one could be used. The results are found on Table 6. The majority of those who marked the "other" choice specified that they learned about the program through a mailing, posted notice, or call via the local Extension office.

Table 6. Knowledge source of Master Gardener program

Factors	N	Percent
Radio	9	5.2
Newspaper	81	46.6
An acquaintance	70	40.2
TV	11	6.3
Other	38	21.8
Total	174	100.0

Views on Satellite Education and Extension Delivery

The major purpose of this study was to discover how the 1987 Master Gardener participants viewed the use of satellite telecommunications for delivery of educational and Extension programs in general, and specifically its use in the 1987 Master Gardener program.

Attendance records were gathered to see if there was any program of particular appeal. As observed in Table 7 all sessions had attendance percentages in excess of 85%.

Table 7. Attendance at the sessions telecast via satellite

Factors	N	Percent
Session 1-Pathology	151	86.8
Session 2-Turfgrass Management	155	89.1
Session 3-Vegetable Gardening	154	88.5
Session 4-Landscape Plantings	168	96.6

Figure 1 shows how the sessions were rated using a scale of 1 to 5, with "5" as excellent and "1" as poor.

Figure 1

Pathology

	Rating	N	Percent
Poor	1	0	0.0
	2	2	1.1
	3	18	10.3
	4	48	27.6
Excellent	5	82	47.1
NR*		24	13.8
		174	100.0

Mean=4.40

Landscape Plantings

	Rating	N	Percent
Poor	1	0	0.0
	2	2	1.7
	3	10	5.7
	4	43	24.7
Excellent	5	107	61.5
NR*		11	6.3
		174	100.0

Mean=4.56

Turfgrass

	Rating	N	Percent
Poor	1	2	0.0
	2	5	2.9
	3	16	9.2
	4	63	36.2
Excellent	5	68	39.1
NR*		20	11.5
		174	100.0

Mean=4.23

Vegetable Gardening

	Rating	N	Percent
Poor	1	0	0.0
	2	1	0.6
	3	13	7.5
	4	47	27.0
Excellent	5	91	52.3
NR*		22	12.6
		174	100.0

Mean=4.5

* NR= non-respondents

Data was analyzed to determine how many telecasts the participants viewed. As shown in Table 8, approximately 80% saw all four.

Table 8. Total number of telecasts seen

Factors	N	Percent
One	13	7.5
Two	6	3.4
Three	17	9.8
Four	138	79.3
Total	174	100.0

Master Gardeners were asked about their overall impressions of the telecasts. Given a series of choices almost two-thirds (63.8%) chose "very well done". Those choosing "well done" comprised 33.9% of the respondents, "fair" was 2.3%, and "poor" was 0.0%.

The telecasts provided the participants the opportunity to see and hear some of the state specialists who are involved in working with gardeners. Given the typical Master gardener program, participants would probably be able to have a maximum of two specialists provide any instruction at the local Extension office. Respondents were therefore asked to respond to the statement, "I believe that I learned just as much from the broadcast as I would if the specialist had been here in person." Given choices of "Agree," "Disagree," and "No opinion," the percentages were 58.6%, 23.6% and 16.7% respectively, with 1.1% NR.

All the telecasts made use of periods of pre-taped video followed by a time of questions and answers. As to the question and answer portion of the telecasts, 86.2% stated they liked it, 5.2% disliked it, and 8.6% NR.

Respondents were surveyed to learn their impressions on whether or not they believed satellite telecasts could be an effective tool for educating the public. The way they replied to

this is seen in Table 9.

Table 9. Views on satellite delivery for public education

Factors	N	Percent
Agree	149	85.6
Disagree	2	1.1
Undecided	6	3.4
NR	17	9.8
Total	174	100.0

Expending time, money, and other resources for satellite telecasts would not be wise for this type of program if no practical application resulted. When asked if they had learned or not learned things via the satellite sessions that they planned to use during the 1987 growing season, 92.0% said they did learn things they planned to put to use, and 1.7% said they had not. Non-respondents were 6.3%.

Another question dealt with the perceptions respondents had toward using satellite telecasts for non-formal, applied ("hands-on") learning. When asked if they felt that such things as sewing, car repair, etc. could be effectively used to learn such skills, 88.5% agreed that this was possible, 4.6% disagreed, and 6.9% did not respond.

In the area of formal education, 81.0% stated that satellite telecasts could be used effectively for education in schools, both private and public. Those who disagreed were 0.6%, the undecideds were 12.6%, and non-respondents were 5.7%.

Part of the reason for this study was to learn how the audience accepted the use of satellite delivery of Extension programs. Having been involved in Extension use of satellites to transfer knowledge and skills via the 1987 Master Gardener satellite sessions, those polled answered according to the figures

in Table 10.

Table 10. Willingness to attend future satellite delivered programs

Factors	N	Percent
Willing to attend	154	88.5
Not willing to attend	3	1.7
Undecided	7	4.0
NR	10	5.7
Total	174	100.0

Comparisons With Selected Variables

The dependent variables were called Scale, Specialist, Tool, Effect, Telecast, Attend, and Satisfy. "Scale" refers to the quality of the telecasts as perceived by the respondents. "Specialist" refers to what the thoughts of the respondents were toward the telecasts versus live appearances by the state specialists. "Tool" refers to perceptions of using satellite telecasts for educating the public. "Effect" refers to the perceptions of using satellite telecasts for applied, "hands on" learning. "Telecast" refers to the perceptions of the Master Gardeners toward using satellite telecasts for formal education in educational institutions. "Attend" refers to the Master Gardeners' willingness to attend other Extension programs which made use of satellite telecasts. "Satisfy" is a variable made up of the means of compiling the other preceeding dependent variables to determine overall impressions of satellite delivery. Reliability analysis was run on these dependent variables, with a resultant alpha of 0.6226. It was felt that this was sufficient to allow a grouping of these variables into the variable entitled "Satisfy".

Two T-Tests were run to analyze data. One T-Test (GENDER) looked for any differences which might exist between gender and how

respondents viewed the use of satellite telecasts for educational/Extension delivery. The second T-Test (FARM BACKGROUND) was done to determine whether or not having a farm background had any effect on the the respondents' views toward satellite educational/Extension delivery.

The results for these two T-Tests can be seen on Tables 11 and 12 found on pages 33 and 34 respectively. As observed, the only significant difference is in the GENDER T-Test where females felt to a significant degree that they learned as much from the telecasts as they would have if the specialists had been teaching in person.

Three One-Way ANOVAs were conducted to determine any effect that the independent variables entitled Garden, Active, and View had upon the dependent variables which dealt with the respondent's perceptions on satellite educational delivery. "Garden" refers to the size of the Master Gardeners' residences. "Active" refers to how long the respondents have been active in gardening. "View" refers to how many telecast sessions were viewed by the respondents. All the dependent variables refer to the same things as in the T-Tests. The One-Way ANOVA tests can be seen in Tables 13, 14 and 15 (pages 35, 36, and 37 respectively).

In the Garden ANOVA, Group 2, those who lived on less than an acre, differed significantly from those in Group 3. They felt they would have learned more from having the specialist present in person. Those who lived where they could not have a garden and/or flower bed, Group 1, thought significantly less of using satellite telecasts to educate the public than Group 3 & 4. This same group also differed significantly from all three other groups in their willingness to attend other extension programs which utilized satellite telecasts in that they were less willing to do so. Groups 1 and 2 were significantly less satisfied than Group 4 with the use of satellite telecasts.

In the Active ANOVA, those who had been active in gardening for 1-5 years, Group 2, differed from those who had been actively gardening longer, in that the Group 2 individuals felt they would

have learned more from an in-person teaching session, and they were less willing to attend an Extension program which used satellite telecasts. Group 2 also differed from Group 4 in being less satisfied with satellite educational/Extension delivery.

In the View ANOVA, those who had viewed three sessions via satellite, Group 3, thought the telecasts were not as well done as those who saw only one or two of the telecasts. Those who saw all four of the telecasts were not as positive toward the telecasts as those who saw only one. Group 4 was significantly less satisfied with satellite educational delivery than were groups 1 and 2.

Table 11. A comparison of gender upon perception ratings of satellite delivery

	Males (X/sd)	Females (X/sd)	T	Prob.
Scale	3.57/0.52	3.65/0.55	-0.89	0.377
Specialist	2.15/0.86	2.55/0.78	-3.14	0.002
Tool	2.95/0.27	2.92/0.32	0.63	0.53
Effect	2.93/0.37	2.88/0.49	0.76	0.45
Telecast	2.88/0.33	2.82/0.42	0.96	0.34
Attend	2.94/0.29	2.90/0.38	0.78	0.44
Satisfy	2.90/0.28	2.96/0.32	-1.30	0.20

Scale refers to the quality of the telecasts as perceived by the respondents.

Specialist refers to what the thoughts of the respondents were toward using telecasts versus live appearances by the state specialists.

Tool refers to respondents' perceptions of using satellite telecasts for educating the public.

Effect refers to respondents' perceptions of using satellite telecasts for applied, "hands-on" learning.

Telecast refers to respondents' perceptions of using satellite telecasts for formal education in educational institutions.

Attend refers to the Master Gardeners' willingness to attend other Extension programs which use satellite telecasts.

Satisfy is a variable made up of the means of compiling the other preceeding variables to determine overall impressions of satellite delivery.

Table 12. A comparison of farm background upon perception ratings of satellite delivery

	Yes (X/sd)*	No (X/sd)**	T	Prob.
Scale	3.58/0.55	3.67/0.50	-1.11	0.27
Specialist	2.42/0.84	2.24/0.84	1.38	0.17
Tool	2.97/0.18	2.89/0.41	1.50	0.14
Effect	2.92/0.39	2.88/0.49	0.66	0.51
Telecast	2.85/0.36	2.85/0.40	-0.16	0.88
Attend	2.90/0.39	2.95/0.21	-1.13	0.26
Satisfy	2.95/0.29	2.91/0.32	0.82	0.41

* Yes means that respondents had a farm background.
** No means that respondents did not have a farm background.

Scale refers to the quality of the telecasts as perceived by the respondents.

Specialist refers to what the thoughts of the respondents were toward using telecasts versus live appearances by the state specialists.

Tool refers to respondents' perceptions of using satellite telecasts for educating the public.

Effect refers to respondents' perceptions of using satellite telecasts for applied, "hands-on" learning.

Telecast refers to respondents' perceptions of using satellite telecasts for formal education in educational institutions.

Attend refers to the Master Gardeners' willingness to attend other Extension programs which use satellite telecasts.

Satisfy is a variable made up of the means of compiling the other preceeding variables to determine overall impressions of satellite delivery.

Table 13. A comparison of perception ratings when grouped by the size of respondents' property

Variable	Group 1 N	Group 1 Mean/ St.D	Group 2 N	Group 2 Mean/ St.D	Group 3 N	Group 3 Mean/ St.D	Group 4 N	Group 4 Mean/ St.D	F ratio	F prob.	Diff.
Scale	6	3.33 0.82	86	3.59 0.56	38	3.63 0.49	43	3.67 0.47	0.79	0.50	None
Specialist	6	2.17 0.98	85	2.18 0.89	37	2.46 0.80	43	2.67 0.64	3.83	0.11	2<4
Tool	6	2.67 0.52	75	2.90 0.39	36	3.00 0.00	39	3.00 0.00	3.57	0.16	1<3,4
Effect	5	3.00 0.00	79	2.92 0.38	37	2.95 0.33	40	2.85 0.53	0.49	0.69	None
Telecast	6	2.67 0.56	80	2.85 0.39	37	2.86 0.35	40	2.90 0.30	0.73	0.53	None
Attend	6	2.50 0.84	80	2.91 0.36	37	2.97 0.16	40	2.95 0.22	3.80	0.01	1<2,3,4
Satisfy	6	2.71 0.52	86	2.90 0.32	38	2.97 0.23	43	3.03 0.24	3.31	0.02	1,2<4

Group 1 are those individuals who live where they are not able to have a garden or flower bed.

Group 2 are those individuals who live on less than an acre.

Group 3 are those individuals who live on an acreage (1 - 5 acres).

Group 4 are farm dwellers (live on more than 5 acres).

Scale refers to the quality of the telecasts as perceived by the respondents.

Specialist refers to what the thoughts of the respondents were toward using telecasts versus live appearances by the state specialists.

Tool refers to respondents' perceptions of using satellite telecasts for educating the public.

Effect refers to respondents' perceptions of using satellite telecasts for applied, "hands-on" learning.

Telecast refers to respondents' perceptions of using satellite telecasts for formal education in educational institutions.

Attend refers to the Master Gardeners' willingness to attend other Extension programs which use satellite telecasts.

Satisfy is a variable made up of the means of compiling the other preceeding variables to determine overall impressions of satellite delivery.

Table 14. A comparison of perception ratings when grouped by the years involved in gardening

Variable	Group 1 N	Group 1 Mean/ St.D	Group 2 N	Group 2 Mean/ St.D	Group 3 N	Group 3 Mean/ St.D	Group 4 N	Group 4 Mean/ St.D	F ratio	F prob.	Diff.
Scale	2	3.50 0.71	26	3.58 0.64	27	3.48 0.51	118	3.66 0.51	0.93	0.43	None
Specialist	2	1.50 0.71	26	1.92 0.80	26	2.42 0.90	117	2.44 0.81	3.61	0.01	2<3,4
Tool	2	3.00 0.00	23	2.87 0.34	24	3.00 0.00	107	2.94 0.30	0.86	0.46	None
Effect	2	3.00 0.00	24	2.92 0.41	24	3.00 0.00	113	2.88 0.49	0.60	0.62	None
Telecast	2	3.00 0.00	24	2.79 0.51	25	2.84 0.37	112	2.88 0.33	0.46	0.71	None
Attend	2	3.00 0.00	24	2.79 0.51	25	3.00 0.00	112	2.94 0.31	1.91	0.13	2<3,4
Satisfy	2	2.83 0.00	26	2.81 0.44	27	2.97 0.25	118	2.96 0.27	2.10	0.10	2<4

Group 1 are those individuals for which 1987 is their first gardening season.

Group 2 are those individuals who have been gardening for 1 - 5 years.

Group 3 are those individuals who have been gardening for 6 - 10 years.

Group 4 are those individuals who have been gardening for 11 or more years.

Scale refers to the quality of the telecasts as perceived by the respondents.

Specialist refers to what the thoughts of the respondents were toward using telecasts versus live appearances by the state specialists.

Tool refers to respondents' perceptions of using satellite telecasts for educating the public.

Effect refers to respondents' perceptions of using satellite telecasts for applied, "hands-on" learning.

Telecast refers to respondents' perceptions of using satellite telecasts for formal education in educational institutions.

Attend refers to the Master Gardeners' willingness to attend other Extension programs which use satellite telecasts.

Satisfy is a variable made up of the means of compiling the other preceeding variables to determine overall impressions of satellite delivery.

Table 15. A comparison of perception ratings when grouped by the number of telecasts viewed

Variable	Group 1 N	Group 1 Mean/ St.D	Group 2 N	Group 2 Mean/ St.D	Group 3 N	Group 3 Mean/ St.D	Group 4 N	Group 4 Mean/ St.D	F ratio	F prob.	Diff.
Scale	13	4.00 0.00	6	4.00 0.00	17	3.47 0.62	138	3.58 0.54	4.13	0.01	3<1,2 4<1
Specialist	13	2.77 0.60	6	3.00 0.00	17	2.29 0.85	136	2.29 0.86	2.55	0.06	None
Tool	12	3.00 0.00	5	3.00 0.00	11	3.00 0.00	129	2.92 0.32	0.53	0.66	None
Effect	12	2.83 0.58	5	3.00 0.00	13	3.00 0.00	132	2.89 0.45	0.41	0.74	None
Telecast	12	2.83 0.39	5	3.00 0.00	13	3.00 0.00	134	2.84 0.39	1.05	0.37	None
Attend	12	2.92 0.29	5	3.00 0.00	13	3.00 0.00	134	2.91 0.36	0.38	0.77	None
Satisfy	13	3.09 0.22	6	3.22 0.14	17	2.98 0.28	138	2.90 0.31	3.77	0.02	4<1,2

Group 1 are those individuals who viewed only one telecast.
Group 2 are those individuals who viewed two telecasts.
Group 3 are those individuals who viewed three telecasts.
Group 4 are those individuals who viewed all four telecasts.

Scale refers to the quality of the telecasts as perceived by the respondents.

Specialist refers to what the thoughts of the respondents were toward using telecasts versus live appearances by the state specialists.

Tool refers to respondents' perceptions of using satellite telecasts for educating the public.

Effect refers to respondents' perceptions of using satellite telecasts for applied, "hands-on" learning.

Telecast refers to respondents' perceptions of using satellite telecasts for formal education in educational institutions.

Attend refers to the Master Gardeners' willingness to attend other Extension programs which use satellite telecasts.

Satisfy is a variable made up of the means of compiling the other preceeding variables to determine overall impressions of satellite delivery.

CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS

As previously stated, the purpose of this study was to determine how participants in the 1987 Master Gardener program perceived the use of satellite telecasts in providing Extension information. The effectiveness of such delivery of Extension information was gathered using a survey and analyzing the resultant data. The findings of this study should provide information useful to those who plan, design, and administer Extension programs and assist them in decisions relating to these areas so that any future use of satellite telecommunications will be conducted in the most effective manner.

Conclusions

1. The findings seem to indicate that both sexes are equally interested in learning horticultural information as evidenced by the nearly 50:50 split between males and females.

2. The 55 and over age group at 41.4% was 15% larger than the next largest group. This may be due to the fact that this group has more time for gardening, and thus may be more interested in this type of program. They may also have been more free to attend the Master Gardener training sessions. Iowa is also know for having a large older population on a per capita basis, so a large percentage of older participants for this program is not unexpected. Attending these sessions may even have been a means whereby certain individuals in this group sought to have some social contacts; the subject matter itself being of secondary importance. This is not believed to be the case however.

3. Over 60% of the population have a farm background. These people may have more of a desire to see things grow and be outside than those with a non-farm background. The older audience may influence this too as there were more farm families when these people were growing up then would be the case with younger people.

4. The age of the audience may also have affected the educational level, as the largest group was those with only a high school education. Older people may have been able to derive a sufficient income with a high school education when they were part

of the work world, and thus there was not the impetus that there is today to go to college. Another explanation may be that people with college education may have developed interests in areas outside of gardening. They may also have more income to pursue activities which are too costly for the non-college educated to learn or be engaged in. Those with only a high school education may be less knowledgeable than their more educated counterparts as to where to go to get horticultural information.

5. It is not surprising to observe that those who live on less than an acre made up the largest group, with twice as many people than the next largest group. This is because the state of Iowa has more urban and suburban dwellers than rural dwellers. This group for the most part may live in single-family homes, which typically are on lots of less than an acre.

6. The employment figures were reasonable when age is again taken into consideration. Under half of those surveyed were fully employed. Those who are fully employed are likely to have less time or inclination to be involved in such a program. Knowing that they are to provide 40 hours of volunteer service in addition to the 40 hours of training may cause less of them to be involved. It is realistic to think that those who are retired or unemployed may have more time to be involved in such a program.

7. Over one out of five intended to sell horticultural products which they had grown. This may be a indication that some Iowans are becoming more involved in agricultural diversification, but this is hard to know without knowing how a random sample of this population may have responded to this question five years ago. It would be interesting to see if this percentage would change in the next five years. The 22.4% figure for those who did intend to sell their products in 1987 is reasonable in light of the fact that 9.8% of the participants owned and operated some type of horticulture enterprise. Those gainfully employed in the horticulture industry comprised 20.7% of the population. They may have attended these sessions to become more knowledgeable about their field and thus do better.

8. Once again, age may have had a bearing upon another variable, this one being years active in gardening. Over

two-thirds of the respondents had been gardening for at least 11 years. Attendance by this group would seem to indicate that they felt there were still things they could learn about gardening from attending this program.

9. This method of delivery did prove to be economically feasible. The cost for each telecast was $995 and was broken down in this manner: uplink charges (beaming the transmission to the satellite) were $325, studio time (includes doing the pre-taping of the taped segments of the telecasts) was $220, and rental of the transponders for beaming the transmissions back to earth was $450. This is a cost of $3980 for the four sessions. In addition, there were costs incurred for the rental of satellite dishes, technical help, and facilities rental at nine sites. These costs were $1155. This gives a total of $5135. It must be born in mind that many of these sites will have access to satellite telecasts free of charge next year as the Extension Service continues to install the necessary equipment at more county Extension offices. Also, the Extension Service now has quality tapes of the four sessions which can be used by its clientele. Linda Naeve determined that the cost of sending one specialist to 13 sites would have cost $1054.23 which includes mileage, meals, and lodging. Thus, delivering this sessions via satellite was economically sound.

Because of the good reports from the 1987 satellite telecasts and their recognized effectiveness, Extension plans to continue using this same approach for the 1988 Master Gardener program. Four sessions will again be telecast, two using 1987 tapes and two using new tapes (Entomology and Fruits).

10. As can be seen in the findings of Chapter 4,the majority of the respondents were satisfied with the satellite portions of the 1987 Master Gardener program, and are favorably disposed toward the use of satellite telecommunications for other Extension uses and for education in general. These findings show that every telecast had a rating mean in excess of 4.2 (5 was a rating of excellent). Nearly 80% of the respondents attended all four of the telecasts. The respondents' overall impressions of the telecasts were such that nearly 98% indicated the telecasts were either well done or very well done. Close to 90% indicated they would be

willing to attend future Extension programs utilizing satellite delivery.

Recommendations

1. There were enough people growing each of the major classifications of plants (Houseplants, Vegetables, Fruit Trees, Lawn, etc.) that all should continue to be taught. Even the smallest response percentage (that for fruit trees) was close to 60%. Thus, there is probably an equal interest in all the major topics being taught. Since over 70% of the respondents spent over four hours per week gardening during the growing season, this is a major activity for these individuals during this time of year. Because of this, Master Gardener programs are in demand and should be continued.

2. Almost one-third of the population did not make prior use of Extension for horticulture assistance prior to this program. This parallels the findings of the evaluation conducted by Kansas State as cited in Chapter II, where more than a fourth of the audience reported never or seldom contacting Extension in the year prior to the evaluation. This would seem to indicate that people are not aware of the help which Extension can provide along the lines of horticulture and other subject matter. It may mean that Extension must do even more to inform the public of the services it offers. Extension personnel answering questions or providing timely advice on the radio is one such means. Master Gardener displays in shopping malls staffed by Master Gardener "graduates" is another method which has been used with good results. Extension staff should get to know officers in any local garden clubs and attempt to have them inform their membership of the services Extension can offer. Since garden magazines are frequently read and used to gain horticulture information, Extension needs to gain the cooperation of these magazines in promoting the use of Extension. It is hard for Extension staff at the county/local level to be as knowledgeable as the public wishes in the different subject matter, but Extension staff should attempt to become better

educated in horticulture. Extension staff at least must let the public know that being an Extension employee means knowing where to go to find the answers to the questions and solutions to the problems encountered. In the particular case of the respondents it is observed that better promotion can be done using mass media.

3. As a whole the participants were pleased with the satellite sessions and felt satellite communications can be used effectively for formal and informal education. The major complaints seemed to focus on two areas. The first is that there were technical problems. Often people could not hear as well as they would have liked. It is believed they were referring primarily to the question and answer period. The author was in the studio during three of the telecasts and observed that the sound technicians in the studio were students. In the opinion of the author the students appeared to be either inexperienced at picking up the sound properly or not too highly motivated to do a quality job. If this was a correct assestment of the situation, those with proper skills and motivation should have done the technical work or the technicians used should have been better trained and/or supervised. As part of the studio audience, the author observed the moderator was too soft-spoken at times. Some of the sites had problems with getting the satellite dish set up to do a good job of receiving the telecasts. Perhaps this could have been prevented by having things set up enough in advance to work the problems out prior to the telecast.

The second often-aired complaint was that the broadcasts went too fast for participants to catch the material which was being discussed. People likely became frustrated because they knew they would be tested over the material and they could not take notes fast enough.

One thing which may have helped would be for each specialist to have put together an outline of his/her session which would have been given to the audience prior to the telecast. This outline would be one which highlighted the key points. Doing these things would have better prepared the audience, and they would know which material was most important.

Another way to have presented the material, but which would

been given to the audience prior to the telecast. This outline would be one which highlighted the key points. Doing these things would have better prepared the audience, and they would know which material was most important.

Another way to have presented the material, but which would not have made use of the satellite system, would have been to send out all the tapes. The Extension offices could then have shown the tapes to the Master Gardeners at the local site at a time which would be most suitable for those involved. There would then be a prearranged time for the state specialist to answer called in questions. It is assumed there is a way that all the local sites could hear the questions and their answers. Doing it this way would allow the audience to view the tapes at their own pace, rewinding and reviewing portions that they wished. They could then take notes and write down questions which they wished the specialist to cover. The cost of making sufficient copies of the tapes would be much less than that incurred for satellite time and for studio use.

4. There was opportunity for Master Gardeners to also elaborate on what they liked best about the telecasts. They generally responded that they liked the question and answer portions, so this format should be continued. Many commented that the information was detailed, concise, and relevant. An appreciation of the videos was also expressed, especially being able to see specimens as well as how things were done. Therefore, it is vital that quality videos be used which are relevant. Some people also liked being able to see and hear the state specialists.

5. If done again, the author recommends the whole data collection method be arranged differently. The response rate was about 50% and should have been much higher. To increase this percentage would require the assistance of the local coordinator of the program. The surveys could be filled in before the Master Gardeners would receive their certificates of completion of the program. The completion of the survey would be part of the criteria for getting the certificate. It is believed that the coordinators did not stress the completion of the surveys. If coordinators had been more persuasive, the response rate may have

Other things could have been done to gain more useful information. One is incorporating the responses to the individual questionnaires. This may have proven to be beneficial to help determine audience satisfaction of the telecasts. Also, another question which could have been asked is one dealing with any formal or informal horticultural training the respondents may have had. This might have influenced the perceptions of the respondents toward the telecasts.

6. The use of satellite telecommunications for educational/Extension delivery shows much promise. There are economic, technical, and ethical issues which may need to be addressed prior to the implementation of any such delivery. Iowa State is making positive strides in this field, but must address the aforementioned issues and constantly evaluate the mechanism of the programs and their results. Those involved in this area must learn from programs conducted by the USDA, other states, and private industry to best use satellite telecommunications to achieve the goal of educating their constituency in the best manner possible.

BIBLIOGRAPHY

Allen, Gene (Production Manager-Oklahoma State Department of Agricultural Information). 1987. Personal letter and enclosed materials. March 24,1987.

Bay, Ovid (Director of Information and Communicatios-USDA). 1987. Personal letter and enclosed materials. March 26, 1987.

Bjorklund, Jan and Joanne Fredmeyer. 1985. Keeping Current Via Teleconferencing. Journal of Extension. Vol.XXIII: 21-24

Brown, Fred. 1986. Telecommunications in Higher Education: Creating New Information Sources. T.H.E. (Technical Horizons in Education) Journal. Vol. 14, No.1: 68-70.

Burke, Jack (Head, Department of Extension Communications, Kansas State University). 1987. Personal letter and enclosed materials. March 24, 1987.

Crowley, John J. Editor. 1986. Research for Tomorrow-1986 Yearbook of Agriculture. United States Department of Agriculture. Washington, D.C.

Dean, Jay W. The Long-Term Effects of Distance Education. Vocational Education Journal. Vol.61, No.1: 28-30.

Dewitt, Jerry (Assistant Dean/Associate Director, Iowa Cooperative Extension Service). 1987. Personal interview. March 11, 1987.

Farm Bureau Spokesman. 1987. National Cooperative to Offer Low-Cost Satellite Probramming. Farm Bureau Spokesman. January 9, 1987.

Garforth, Chris. 1985. Mass media and communications technology-Agricultural Extension section. Media in Education and Development. Vol.18, No. 4: 175-179.

Greene County Rural Electric Cooperative. 1987. NEWS FLASHES. April 1987.

Iowa REC News.1987. Affordable telecommunications for rural America. Iowa REC News. Vol.41 No.1: 9.

Iowa REC News. 1986. Rural utilities form telecommunications cooperative. Iowa REC News. Vol.40 No.9:11.

Iowa REC News. 1987. Bits and Pieces. Iowa REC News. Vol.41 No.5:6.

Iowa State University. 1986. Satellite Transmission Services.

Iowa State University College of Agriculture. 1986. Survey.

Johnson, Jan. 1986. Agriculture on Microwave. Farm Industry News. Vol.19 No.4:26.

Moore, Gary E. 1986. High Teachnology. The Agricultural Education Magazine. Vol.59, No.3:17-19.

Rosenweig, Harlan J. 1986. The Upside of Downlinking. E-ITV. Vol.18, No.:1: 32-33.

Steimel, Karen. 1987. First Iowa Telecommunications Cooperative Formed. Iowa REC News. Vol.41 No.2:5.

Vocational Education Journal. 1986. The Video Technologies: What They Are and What They Cost. Vocational Education Journal. Vol.61 No.1:29.

Whiting, Larry (Head, Information and Applied Communications, Ohio Cooperative Extension Service). 1987. Personal letter and enclosed materials.

APPENDIX A
QUESTIONNAIRE

Dear Master Gardener participants:

To determine the quality and effectiveness of the Master Gardener satellite telecasts, please take a few minutes to answer the following. All responses are confidential and will be used solely to evaluate these telecastscasts. The following code is only for determining how many telecasts each participant was able to view and evaluate.

Code (Last 4 digits of your S.S.#) _____

1. I attended the Master Gardener program which was held in _____ county.

2. I reside in _____ county.

3. I am a: A. Male. B. Female.

4. What is your age. (Circle one)
   A. under 20 B. 20 - 30 C. 31 - 40 D. 41 - 50 E. 51+

5. I _____have a farm background. (Circle one) A. do B. do not

6. Which of the following best describes your educational background? (Circle one)
   A. Am attending high school
   B. Attended, but did not graduate from high school
   C. High school graduate
   D. Have an associate's or two-year degree
   E. Worked on,but did not receive a bachelor's degree
   F. Have a bachelor's degree
   G. Have formal education beyond a bachelor's degree

7. I live: (Circle one)
   A. where I cannot have any garden or flower bed.
   B. on less than one acre.
   C. on an acreage (1-5 acres).
   D. on a farm (over 5 acres).

8. Currently, I have the following items for which I am primarily responsible: (Circle all which apply)
   A. Houseplants
   B. A vegetable garden
   C. A flower bed/garden
   D. Small fruits (strawberries,grapes,etc.)
   E. Fruit trees
   F. A lawn
   G. Shrubbery/hedges

9. I am: (Circle all that apply)
   A. employed part time. B. employed full time. C. in school.
   D. retired. E. unemployed.

10. I spend _____ hours per week working in my lawn/garden/flower bed, etc., during the growing season. (Circle one)
   A. less than 2 B. 2 - 4 C. over 4

11. Prior to this Master Gardener program, I made use of extension materials and staff for horticulture information. (Circle one)
   A. True B. False

12. I read these magazines on a regular basis for information about gardening and lawn care. (Circle all which apply)
   A. *Organic Gardening*
   B. *Mother Earth News*
   C. *Better Homes and Gardens*
   D. *Horticulture*
   E. *Iowa Horticulturist*
   F. Others (please list)_____
   _____
   _____

13. The first place I usually go for new information about gardening is: (Circle one)
   A. my local County Extension office.
   B. garden magazines.
   C. other (please specify)_____

14. I plan to sell garden produce, flowers, etc. this growing season from my own store/ greenhouse or home garden. (Circle one)
   A. True B. False

15. I am gainfully employed in the horticulture industry. (Circle one)
   A. Yes B. No

16. If you answered "Yes" in Question 15, how so? (Circle one)
   A. Own and operate any of the following: truck farm/ greenhouse/ floral shop/ etc.
   B. Am employed by any of the following: truck farm/ greenhouse/ floral shop/ etc.

17. I have been active in gardening: (Circle one)
   A. This will be my first garden season B. 1-5 years
   C. 6-10 years D. 11 or more years

18. I learned about the Master Gardener program from: (Circle all that apply)
   A. Radio B. Newspaper C. Someone I know
   D. TV E. Other (please specify) _____

19. I viewed the following broadcast(s): (Please circle all those viewed)
   A. Plant pathology
   B. Turfgrass
   C. Vegetables
   D. Woody ornamentals

20. Please rate the sessions you viewed, using a 1 to 5 scale with "5" as excellent, "1" as poor. (You may use the same number more than once)
   A. Plant pathology _____
   B. Woody ornamentals _____
   C. Turfgrass _____
   D. Vegetables _____

Comment: _____
_____
_____
_____
_____

21. Overall, I believe the broadcasts were: (Circle only one of the following)
   A. very well done B. well done C. fair D. poor

Comment: _____
_____
_____
_____
_____

22. I believe that I learned just as much from the broadcasts as I would if the specialist had been here in person. (Circle only one.)
   A. Agree B. Disagree C. No opinion

23. What did you <u>like most</u> about the broadcasts. _____
_____
_____
_____
_____

24. What did you dislike most about the broadcasts. _____

_____

_____

_____

_____

25. I liked / disliked the question and answer time. (Circle one)

26. Satellite telecasts can be an effective tool for educating the public. (Circle one) A. Agree B. Disagree C. Undecided

27. Check one:

_____ I learned things during the telecasts which I plan to use this year with my own lawn, garden, etc.

_____ I did not learn things during the telecasts which I plan to use this year with my own lawn, garden, etc.

28. Satellite telecasts can be an effective way to learn such things as car repair, sewing, farm safety, etc. (Circle one)
A. Agree B. Disagree

29. I currently have easy day-to-day access to satellite telecasts. (Circle one)
A. Yes B. No

30. If you answered "Yes" in Question 29, how so? (Check all which apply)
__ Have own satellite dish
__ My family/ neighbor/friend has a system I can use

31. I believe satellite telecasts can be used effectively for education in public and private schools, colleges, universities, etc. (Circle one)
A. Agree B. Disagree C. Undecided

32. Would you be willing to attend other extension programs which use satellite telecasts ? (Circle one)
A. Yes B. No C. Undecided